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DD/A [REDACTED]
83-0395

ODP-83-209

4 FEB 1983

MEMORANDUM FOR: Executive Director

VIA: Deputy Director for Administration

25X1

FROM: [REDACTED]

Director of Data Processing

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SUBJECT:

Supercomputers [REDACTED]

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REFERENCE:

Multiple Addressee Memorandum, from
[REDACTED] Chief, Policy and Planning
Staff, ICS, dtd 26 January 1983, Same Subject,
DCI/IC 83-4224Action Requested

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1. Paragraph 6 is a recommendation that you sign the memorandum at Attachment I. This memorandum is in response to the Reference request from [REDACTED] of the IC Staff for answers to a series of questions on Agency use of supercomputers, and the U.S. Government role in encouraging domestic supercomputer development. Due to the time limitation for coordination and preparation of the response, the information and positions presented must be viewed as tentative. [REDACTED]

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Background

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2. As the Reference indicates, an "Ad hoc Committee on Supercomputers," chaired by Doug Pewitt, Assistant Director, Office of Science and Technology Policy (O/S&TP) met on 24 January to review supercomputer issues. The Intelligence Community was represented by [REDACTED] Chief, Policy and Planning Staff, ICS. Mr. Pewitt tasked committee members to respond to a set of questions by 7 February. The Office of Data Processing was, in turn, tasked by the CIA Executive Secretariat with providing an Agency response. In the limited time available, we have done our best to informally touch base and solicit the opinions of key DDI and DDS&T players. [REDACTED]

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3. In our judgment, there are two key points from an Agency perspective. First, we are in the process of evaluating Agency requirements for a supercomputer. The Information Handling

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from attachments.

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SUBJECT: Supercomputers [REDACTED]

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Systems Architect Staff believed such a requirement existed. His draft plan envisioned a \$60 million dollar, six-year program to implement a supercomputer capability in CIA. At this point, however, detailed supporting documentation for the requirement does not exist. There is an ongoing DDI and ODP effort to collect and refine requirements. DDI is, in fact, contemplating obtaining contractual support for this effort. ORD is also engaged in evaluating the performance of the Cray-1 supercomputer as compared to top-of-the-line IBM computers, as well as investigating the software conversion implications in the use of these machines (see Attachment II). One thing is clear, however, a supercomputer capability, if required, will not come cheap. The costs of hardware, software and operations will be high. Obtaining the necessary additional highly-skilled personnel and requisite space will also be a difficult task. [REDACTED]

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4. The second point to be noted is the security implications inherent in the use of foreign-manufactured ADP equipment. Headquarters Notice [REDACTED] generally prohibits the use of "foreign ADP resources." A Japanese manufactured supercomputer, for example, would certainly fall under the purview of that notice. The issue with use of a Japanese supercomputer by the Agency is not primarily one of economics ("Buy America") but one of security. Use of a foreign-manufactured supercomputer would increase our vulnerability to the actions of a hostile intelligence service. (Examples are: covert modifications to capture data or deny use of the machine; denial of support or access to follow-on technology, etc.) If a solid supercomputer requirement is identified, a domestic machine would clearly be preferable, if not a necessity. [REDACTED]

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5. In preparing the attached response, we have had considerable discussions with DDS&T and DDI personnel. We have not, however, had time for formal coordination. The last two questions were particularly difficult ones. Question F in the Reference relates to the Federal Government's role in stimulating supercomputer development. Due to the limited time available and the complexity of this issue, we feel that it is inappropriate to present a detailed Agency position. We have, however, emphasized the importance of domestic sources from a security perspective and the resulting implication that the existence of domestic sources cannot prudently be left to market forces alone. For Question G, on the probable success of Japanese supercomputer efforts, we have relied solely on the input of the Office of Global Issues, DDI. [REDACTED]

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SUBJECT: Supercomputers

Recommendation

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6. It is recommended that you sign the attached response to questions on Agency use of supercomputers, and the U.S. Government role in the development of domestic supercomputers.

Attachments: a/s

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cc:

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SUBJECT: Supercomputers (U)

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Central Intelligence Agency



Washington, D.C. 20505

83-03951

MEMORANDUM FOR: Chief, Policy and Planning Staff,
Intelligence Community Staff

SUBJECT: Supercomputers

REFERENCE: Your Memorandum, dtd 26 January 1983, Same
Subject, DCI/ICS 83-4224

1. In the Reference, you asked CIA to respond to a set of questions on supercomputers. Brief answers to these questions are provided in the attachment.

2. From a CIA perspective, there are two main points we would like to make concerning supercomputers. First, we are currently uncertain as to whether we have definite requirements for a supercomputer capability. In fact, we are investigating this very issue at this time. We, therefore, have not made a decision to acquire a supercomputer. We believe that this would be a costly and complex exercise and are not prepared to proceed until we are convinced that the benefits outweigh the costs.

3. Second, we are quite concerned about being limited to foreign sources (presumably Japanese) should we decide to acquire a supercomputer. Agency policy generally prohibits the use of foreign ADP resources. This policy is derived from security concerns only. That is, in our judgment, the use of foreign ADP resources greatly increases our vulnerability to manipulation by a hostile intelligence service. Therefore, we believe domestic sources for supercomputers should be fostered. How to do this, however, is a complex policy question for which we have no simple answer at this time.

4. My action officer on supercomputers is [redacted]
[redacted] Director of Data Processing. Please feel free to
contact [redacted] if you have any questions or
comments on this response. [redacted] may be reached on
[redacted]

Charles A. Briggs

Charles A. Briggs
Executive Director

Attachment: a/s

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ATTACHMENT

CIA Response to O/S&TP Questions
on Supercomputers (DCI/ICS 83-4224)

- A. Do you currently own and operate or time share a super-computer? How many or how much usage?

We do not own or operate a supercomputer.

- B. Do you have firm plans to acquire the next generation supercomputer? What specs? When? How many? Approximate dollar funds per supercomputer?

We have no firm plans as of now.

- C. Is there a difference in your requirement between a "big number cruncher" and an even bigger and more complex AI-based machine?

Users have primarily expressed interest in the "big number cruncher" variety. However, the importance of AI is recognized and the potential of supercomputers in this area is being investigated. A complete answer to this question awaits a detailed identification of Agency requirements.

- D. Have you identified a US source or sources?

It is too early in our planning to have had other than general discussions with potential sources.

- E. What impact would a successful Japanese fifth generation and supercomputer with the approximate performance characteristics (described in the attachment) have on your agency?*

Because of security concerns, Agency policy generally precludes the use of foreign ADP resources.

- F. Is there a role for the federal government in stimulating, partially funding, or actually developing the fifth generation supercomputer? One body of opinion asserts the US Government should only indicate the range of performance characteristics desired, the best estimate on quantity required and probable time frame for delivery with a tolerable price range.

*Wording of Question E was modified for clarity.

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From an Agency perspective, the existence of a domestic source for supercomputers is critical to any future Agency use of supercomputers. Unless we are content in leaving this up to market forces only, we must support a role for the Federal Government in encouraging domestic supercomputer development. Developing an Agency position on the nature of this role would require considerably more time than was available for the preparation of this response.

- G. Do you have an opinion on the probable success or range of performance the Japanese are likely to achieve? Basis for opinion?

The Office of Global Issues, DDI has prepared the attached response to this question.

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CDP-43-470

4 FEB 1983

MEMORANDUM FOR: Director, Office of Data Processing

FROM:

Director of Global Issues

SUBJECT: Japanese Supercomputer Developments

REFERENCE: DCI/ICS 83-4224, dated 26 January 1983

1. At the request of your Policy and Plans Group, we are providing our assessment of Japanese capabilities and plans for supercomputer developments. Specifically, the attachment responds to Question G of the reference, concerning Japanese prospects for success in developing supercomputer systems.

3. If you have any questions or comments please call
Chief, Technology Analysis Branch,

Attachment:
As stated

This Memorandum is classified CONFIDENTIAL NOFORN
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ORD-077-83

25 January 1983

MEMORANDUM FOR : Deputy Director of Science & Technology

25X1 FROM : [REDACTED]
 Chief, Processing and Analysis
 Technology Group
 Office of Research and Development

25X1 SUBJECT : CRAY Super Computers [REDACTED]

25X1 1. Action_Required - None, information is provided in anticipation of a briefing by CRAY. Information includes a brief description of the CRAY and other super computers, a reminder of DDI and ODP interest in CRAY's, and, a description of ORD research with CRAY's. [REDACTED]

25X1 2. __The_Super_Computer - Most computers today process information serially -- they perform one operation at a time on one piece of data at a time. This is appropriate for a large class of computing problems generally described as "business applications" which have relatively large amounts of input and output (text, for example) and relatively modest amounts of computation per datum. Some scientific problems, however, are more computationally intensive. Moreover, they can be described algorithmically in terms of parallel processing -- e.g., matrix arithmetic. The epitome of computers designed for such jobs is the CRAY, designed by Seymour Cray. Super-cooled and super-expensive, the CRAY provides a very fast array processing capability -- one so fast and powerful that it commonly is fed by several very large computers which manage the file storage and housekeeping. Perhaps fifty such computers have been sold. They are in use by oil companies, NSA, and Los Alamos, among others. [REDACTED]

25X1 3. Agency_Interest_in_Super_Computers_ -- At various times, the Central Intelligence Agency has discussed acquiring such a capability. [REDACTED] at an EXCOM meeting several years ago, exclaimed its virtues in terms of the faster turnaround that OD&E engineers could get on their

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SECRET**SUBJECT: CRAY Super Computers**

modelling computations; alternatively, a more complete exploration of any "option-space" could be thus undertaken. The DDI has also proclaimed the virtues of a CRAY and ODP tried to determine the Agency's needs. Apriori, ODP raised two issues above and beyond the cost: (i) what additional skills would they have to acquire for such an unfamiliar beast? and, (ii) what software modifications are required to have computer programs utilize the CRAY potential? There have been several panels and working groups within the Agency that have been examining the problems dealing with the Agency's computational requirements for the future. A recommendation from one of the panels has been that a scientific computing environment (e.g., CRAY, IBM 3838, etc.) will be required to satisfy the Agency's needs within this decade. [redacted]

4. ORD_Research - The Office of Research and Development has recently initiated a project with Los Alamos National Laboratory (LANL) to examine the computational efficiencies of super computers (e.g., CRAYs) and to identify the problems in converting software to run on these computers. ORD has had extensive experience in developing and/or converting large software packages to run on the Agency's computer system. Sometimes, the packages have placed enormous computational burdens on the Agency's system. [redacted]

5. The ORD project will compare the CRAY (at LANL) with the IBM 3081 (at the Agency). This benchmarking study will be performed with several software systems with which ORD has had experience in applying it to actual intelligence applications. In most of the cases, the software packages have not been developed or optimized to obtain a maximum performance from either type of hardware configuration, i.e., parallel processing for CRAY or serial processing for the IBM. [redacted]

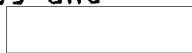
6. The following types of model formulations and their related intelligence application will be used in this benchmark study:

simulation models	- space decision analysis
	- reservoir analysis
	- hydrologic analysis
linear programming	- refinery analysis
network models	- transportation analysis
computer graphics	- orbital graphics; maps
econometric models	- Soviet and Common Market models.

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SUBJECT: CRAY Super Computers

25X1 7. An ORD research report will be prepared at the completion of the project. It is anticipated that the report will be completed in the last quarter of 1983. The report will summarize the performance evaluation tests and analyze some of the potential benefits and problems. 

/s/

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